REQUEST FOR PROPOSAL (RFP)

'Healthy and efficient buildings'
Technical support for the expansion of C40 Multiple Benefits Deep
Retrofit tool and five cities' data collection

C40 Climate Leadership Group, Inc.

120 Park Avenue, 23rd Floor
New York, NY 10017
United States of America 18

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1. C40 CITIES CLIMATE LEADERSHIP GROUP

The C40 Cities Climate Leadership Group is a network of nearly 100 mayors of the world's leading cities, who are working to deliver the urgent action needed right now to confront the climate crisis, and create a future where everyone, everywhere can thrive. Mayors of C40 cities are committed to using a science-based and people-focused approach to help the world limit global heating to 1.5°C and build healthy, equitable and resilient communities. Through a Global Green New Deal, mayors are working alongside a broad coalition of representatives from labour, business, the youth climate movement and civil society to go further and faster than ever before.

C40's team of 200+ staff is headquartered in London, with offices in New York, Joburg, Singapore, Delhi, Rio de Janeiro, Copenhagen, Beijing and Paris, and individual staff based across 25+ different locations, with the Office of the Chair based in London.

The strategic direction of the organisation is determined by an elected Steering Committee of C40 mayors which is chaired by the Mayor of London, Sadiq Khan. Three- term Mayor of New York City Michael R. Bloomberg serves as President of the C40 Board of Directors, which is responsible for operational oversight. A nine-person management team, led by Executive Director, Mark Watts, leads the day-to-day management of C40. C40's three core strategic funders are Bloomberg Philanthropies, the Children's Investment Fund Foundation (CIFF) and Realdania.

C40 positions cities as a leading force for climate action around the world. We define and amplify their call to national governments for greater support and autonomy in creating a sustainable future. Working across multiple sectors and initiative areas, C40 convenes networks of cities providing a suite of services in support of their efforts, including direct technical assistance; facilitating peer-to-peer exchange; and research, knowledge management and communications.

As a climate organisation of the world's greatest cities, C40 supports its members to move on to a low carbon development pathway, adapt to climate change, curb GHG emissions, and engage in partnerships among themselves and with global organisations, national governments, the private sector and civil society.

To learn more about the work of C40 and our cities, please visit our website, or follow us on Twitter, Instagram, Facebook and LinkedIn.

2. BUILDING RETROFITS BACKGROUND

The building sector is at the center of both societal and environmental agendas as buildings operation currently absorbs nearly 55% of global electricity, building and construction activities together account for 39% of global final energy use and 36% of energy-related carbon dioxide (CO_2) emissions[1]. Furthermore, energy-related emissions from buildings have risen in recent years.

Whether living, working, being educated, or seeking to meet care and consumption needs, people spend most of their time inside buildings. According to the World Health Organization (WHO)[2], millions of citizens spend around of 90% of their time indoors in Europe: in homes, schools, workplaces and public spaces. Thus, indoor air quality, temperature, lighting, humidity, and noise affect human physical and mental health, as well as the capacity for concentration, rest, and interaction. In addition, the increasing cost of energy is a factor of strain and stress for those who experience energy poverty and cannot afford the right living conditions. These problems, related to buildings quality, disproportionally affect groups in situation of socioeconomic vulnerability.

Building retrofitting means changing its systems, conditions, or/and structure after the building's construction and occupation, resulting in increased building performance and improved amenities for occupants. Retrofit investments are crucial for GHG emission reductions, strategic for energy and cost savings, and needed for improving health and quality of life in cities across the globe, especially considering that existing buildings comprise the largest segment of the built environment. Improving indoor environmental quality, decreasing moisture penetration, and reducing mold retrofit actions result in improved occupant health and productivity. At the same time, they can be designed to enhance buildings' accessibility, safety, and security.

On the economic side, unhealthy buildings will cost the UK economy over £55 billion between 2019 and 2060, according to the UK Healthy Homes Barometer report produced by RAND Europe and VELUX. The annual cost attributed to sick building syndrome in commercial workplaces only in the US is estimated to be between $10 billion to $70 billion[3]. Moreover, by reducing energy consumption and the cost of heating, cooling, and lighting, energy conservation retrofits lower energy expenses, as well as reduces energy poverty. Moreover, as buildings become less costly to operate, they increase in value, last longer, while contributing to a better, healthier, more comfortable environment.

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[1] Word Green Bulding Council (2019). New report: the building and construction sector can reach net zero carbon emissions by 2050.
[2] WHO, 2013. Combined or multiple exposure to health stressors in indoor built environments. An evidence-based review prepared for the WHO training workshop "Multiple environmental exposures and risks". 16-18 October, 2013. Bonn, Germany.
[3] Awada, M., Becerik-Gerbera, B., HoquebZheng, S., et al. (2021). Ten questions concerning occupant health in buildings during normal operations and extreme events including the COVID-19 pandemic. Building and Environment. Volume 188, 15 January 2021, 107480

According to the International Energy Agency (IEA), one in five buildings worldwide needs to be retrofitted to be zero-carbon-ready by 2030[4]. A combination of retrofit actions is required for that, from improving the building fabric to reducing the need for heating and cooling to changing the buildings' services to carbon-free systems (for heating, cooling, ventilation, hot water, electricity).

Nevertheless, the cities'-built environment is not yet on this path. For instance, in European Union, deep retrofits that reduce energy consumption by at least 60% are carried out in only 0.2% of the building stock per year[5].

Investing in building retrofits shows to be even more urgent in the context of the recovery from the COVID-19 crisis. The C40 Global Mayors COVID-19 Recovery Task Force released research pointing out that if COVID stimulus funds are driven to green solutions they would halt the climate crisis and deliver much faster economic recovery as better buildings tackle many of the problems facing cities: cutting emissions, saving costs, increasing buildings' resilience in face of climate change-induced extreme weather, and improving quality of life for residents. In addition, large-scale programs of building retrofit have huge potential to create good and secure jobs.

Numerous reports have highlighted the potential for energy efficiency to deliver substantial local growth and green jobs. The International Energy Agency (IEA) estimates that between 9–30 jobs in manufacturing and construction would be created for every million dollars invested in retrofits or efficiency measures in new builds.

If the central governments have an important role in prioritizing retrofits investment anchored on national strategies and policies, as well as driving international and national resources to the agenda, they are not able to solve the retrofitting gap alone. To reach the infrastructure and populations most in need and to achieve effective and sustainable results, top-down and bottom-up approaches have to be combined for planning, implementing, and monitoring retrofit programs.

Local authorities are well-placed to lead retrofit actions due to their knowledge of the local housing stock and socioeconomic dynamics, being able to establish priorities and embedded strategies. They are in a good position to broker and facilitate dialogues between the industry and homeowners, taking into consideration the climate and energy pledges and policies. This is extremely relevant for coordinating actions and integrating different knowledge fields toward a comprehensive, holistic, and collaborative approach at the city level, overcoming the current fragmentation of the Repair, Maintenance, and Improvement (RMI) into disciplines and technologies.

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[4] IEA (2021). Net zero by 2050 hinges on a global push to increase energy efficiency. Article — 10 June 2021. Available at: https://www.iea.org/articles/net-zero-by-2050-hinges-on-a-global-push-to-increase-energy-efficiency. Visited on June 2, 2022.

[5] EC, (2020). A renovation wave of Europe, Greening our buildings, creating jobs, improving lives. European Commission. Available at: https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en. Visited on June 2, 2022.

In this context, it is crucial to disseminate the knowledge available on retrofit actions, provide customized and applicable data for local authorities to design their programs and prioritize investments and promote holistic approaches, which assume buildings as systems with multiple and interconnected functionalities. Combined quantitative and qualitative data is crucial to enable a more holistic understanding and decision-making process and effectively engage stakeholders and gain support.

In this sense, an evidence-based multiple benefits approach shows to be effective in raising the priority of retrofit investments and integrating different government bodies and other relevant sectors toward comprehensive deep retrofitting strategies. However, although cities might want to model the benefits of climate actions, they face the usual capacity and data barriers.

3. ABOUT THE 'HEALTHY AND EFFICIENT BUILDINGS' PROJECT

C40 and VELUX have partnered to design and implement the 'Healthy and efficient buildings', a two-year project aiming to provide a detailed local proof of concept and approach for investing in municipal buildings retrofits. That will be reached by supporting five C40 cities to identify actions that increase the sustainability of buildings and the health of those that occupy or use them. The tailored support to the cities embraces three main components: (i) produce evidence of the health and economic benefits and greenhouse gas emissions reduction potential of investing in municipal building retrofits with a focus on indoor comfort parameters like daylight, fresh air, thermal comfort, and noise; (ii) help cities build political momentum for ambitious retrofit strategies including health, economic and environmental benefits; and (iii) provide concrete recommendations to cities on how to design policies that both deliver multiple benefits for inhabitants and reduce greenhouse gas emissions.

Regarding the municipal buildings in focus, at least three categories will be covered: schools, social housing, public buildings (i.e., offices). Among the five cities, there will be different climate patterns, including both cold and hot, dry and humid climate conditions, and diverse land use and built environment characteristics.

Based on the in-depth support of five cities, the project will also contribute to setting a global agenda for the importance of investing in healthy buildings by scaling results from the city-specific analysis to estimate the potential of investing in healthy and efficient buildings in cities across the world.

The five core cities involved in the project are located in Europe, North America and Africa: Amsterdam, Miami, New York, Washington DC and Tshwane.

The project has as main action lines:
- Knowledge development: developing city-driven knowledge and city-specific strategy and action plan for the delivery of sustainable and healthy and efficient building retrofits to accelerate retrofits and achieve maximum benefits.

- Vulnerability mapping: carrying out a vulnerability mapping, considering environmental, economic, and social criteria, to assess the municipal buildings that pose the greatest risk to the health of the occupants, based on indoor comfort parameters.
- Enhancement and application of the deep retrofits multiple benefits toolkit: producing assessments of the health, economic, and GHG reduction benefits of retrofitting a set of municipal buildings, using the C40's multiple benefits of retrofits tool, which will be reviewed and expanded within this project.
- Data collection support: working with cities to support data collection, understanding of data challenges and strategies to overcome them.
- Case studies: consolidating the results into a strong case for action for each city that provides the rationale and evidence base for the city to target retrofitting measures including indoor comfort parameters to a set of municipal buildings, delivering health and economic benefits to those most in need.
- Dissemination of project results: undertaking activities to raise awareness and accelerate health benefits of retrofits in cities globally, as sharing the cases' results at webinars, seminars, and conferences attended by governments, academia, and specialists in the field.

The scope of this Request for Proposals (RFP) refers specifically to the enhancement of the [Multiple Benefits of Deep Retrofits toolkit](#).

4. DETAILS OF THIS REQUEST FOR PROPOSAL (RFP)

This RFP aims to support the development of two Healthy and Efficient Buildings project's outputs:

1. An **expanded deep retrofits tool** including a wider range of health, environmental and health benefits.

   The consultant will provide **technical support for the inclusion of additional multipliers and functionalities into the [existing Excel tool](#)** based on a focused and detailed literature review of English and non-English resources on building retrofit actions that is currently under development. The tool expansion will focus on including new different types of buildings schools, social housing, public buildings, etc.), different climate patterns (hot and cold, dry and wet weather), and urban areas (with diverse density, in central and peripheral areas): new multipliers and functionalities should be added considering this diversity. **C40 team will be responsible for the tool expansion, the consultant will bring expertise and knowledge to support this process** by working together to solve technical challenges, checking data, multipliers and scores adopted, and reviewing the tool format and content.

   For that, it is expected that the consultant proves to have extensive background and technical knowledge in Excel-based analytical tool development and building retrofit. It will also be an added value if specific expertise in quantitative multipliers linking environment changes to health and economic benefits can be demonstrated.

The foreseen technical support comprehends three workstreams: (i) supporting C40 team to find solutions to the main challenges of the tool development based on the currently ongoing literature review findings, which is being undertaken by Mitsidi Projetos, and, if needed, complementary references on existing experiences, tools and projects; (ii) discussing technical approaches, multipliers and formulas at work meetings with C40 team; and (iii) reviewing the tool and supporting C40 on its adjustment, if needed, based on two tests with cities participating in the project. From the tool review, C40 expects to have recommendations on how its usability and consistency could be improved. On the tool adjustment, C40 will consult the partner if there is any technical challenge requiring additional references/examples or technical specialised knowledge to be addressed.

2. **Assessment of the potential benefits of deep retrofit actions with the retrofits tool** for five participant cities: Amsterdam, Miami, New York, Tshwane and Washington DC.

The support required here has three focuses: (i) **data collection**, helping C40 and cities to identify data sources, gathering city-specific data from publicly available sources as well as confidential data provided by the participating cities to serve as input to the deep retrofits tool; (ii) **support C40 team with the development of proxies** that could be used in case of lacking specific city data, based on previous and relevant experiences, academic and technical references; and (iii) **reviewing the data collected** to ensure its consistency and robustness before starting the analysis of the benefits of the deep retrofit for the five cities. The data to be collected will be defined based on the findings of the currently ongoing literature review on retrofit actions benefits and multipliers and on the scope of the expanded deep retrofits expanded tool.

Hence, to support this project's output, it is expected that the consultant brings expertise in collecting, preparing, and analysing quantitative data. Previous experience in handling city-level data is welcome.

4.1 ACTIVITIES INVOLVED

To technically support C40 in the development of the two outputs mentioned above, the consultant should consider the following reviewer activities:

1. Technical support for the deep retrofits tool expansion

- Go through the deep building retrofit literature review (previous and currently ongoing) results on priority actions, related multiple benefits and multipliers.
- Participate in bi-weekly meetings with C40 team to discuss technical approaches, multipliers and formulas, as well to provide recommendations for overcoming specific technical challenges on the tool expansion.
- Respond to punctual consultations from C40 team by email on the technical development of the tool. Exceptionally, meetings can be scheduled in between the bi-weekly ones, and if they are not needed at any point, bi-weekly meetings can be skipped.

- If needed, search for academic and practical (i.e., projects, technical reports) references that can offer insights on how to deal with technical challenges on the tool expansion, referring to benefits quantification, multipliers linking environment changes to benefits and proxies, and provide recommendations to C40.
- Review two intermediate versions and the final version of the expanded deep retrofits tool and recommend adjustments and improvements, aiming at its consistency and robustness and considering the feedback provided by participant cities, which C40 will share with the consultant.
    - o The first review should be a line-by-line detailed work to track errors and anticipate users' difficulties and questions, and a tool test with fictitious data to check its functionalities and results.
    - o The second review will be of a tool fulfilled by a city aiming at a sense checking, picking up any remaining errors, and identifying non-anticipated user needs (e.g. more clarity on the metrics of the required inputs).
    - o The final review will focus on the usability of the tool, considering its format and navigability, and includes a final check of its formulas.

2. Data collection support and datasets review

- Review datasets provided by the five participant cities and provide recommendations to ensure the quality and robustness of data provided.
- Participate in a meeting with each city to gather feedback, identify the difficulties faced by them on data collection and provide recommendations for increasing the consistency of the collated data.
- Identify public databases to address the gaps in the data provided by the five participant cities and provide guidance for them to address the gaps efficiently.
- Gather the complementary data from the mapped databases and highlight any caveats in integrating it into the data provided by cities.
- Provide recommendations to C40 on how to deal with the remaining data gaps and suggest proxies based on references or previous experiences.
- Review the final dataset, including proxies, to input into the tool for the five cities deep retrofits' benefits assessment.
- Sense-check and review the results from other studies to ensure the robustness of the tool calculations.

4.2 DELIVERABLES

The selected consultant should deliver the following deliverables resulting from the up-mentioned activities:

Deliverable 1: Short Word document after each bi-weekly meeting with C40 compiling the recommendations provided to each item discussed, including technical questions and challenges raised by C40 team. The doubts and challenges to be

discussed at each meeting will be sent to the consultant at least three working days ahead of the call. The document should be structured by item (questions/challenges) from C40 consultation, including the references supporting or exemplifying the recommendation, if needed. The consultant should send the Word document by email within three working days after each meeting.

Deliverable 2: Recommendations for improving two intermediate versions and a final/complete version of the expanded tool based on a detailed, line-by-line, review, sense-checking, user needs, review of the tool's final content and format, including its structure, formulas, links, outputted data, usability/navigability, and clarity of instructions to the users.
The recommendations are expected both in **comments on the tool Excel spreadsheet** and in a **Word document** detailing how the suggested adjustment/improvement can be implemented. C40 will share the Excel tool to be reviewed at least two weeks ahead of the deliverable 2 deadline.

Deliverable 3: Detailed review of datasets of the five participant cities, pointing out possible inconsistencies, lack of accuracy, and gaps and recommending adjustments. The datasets will serve as input to the deep retrofit tool, but this review refers to the first set collected and compiled by the cities with the support of the C40 team.
The deliverables include the consultant's **comments on the datasets Excel spreadsheets** and a **Word document** with the main inconsistencies, gaps found and recommended adjustments. C40 will send the datasets Excel spreadsheets to be reviewed to the consultant at least one week prior to deliverable 3 deadline.

Deliverable 5: Complementary datasets to the cities' data addressing the gaps identified and **suggested proxies** to deal with the remaining gaps. The datasets should be produced by the consultant by compiling public data from available public databases. As deliverables, an **Excel spreadsheet** with one tab per category of data (considering the inputs required for the tool), including the proxies suggested for each remaining data gap.

Deliverable 6: Detailed review of the final datasets and proxies to be used for the five cities assessment on the deep retrofits tool. The review should point out possible inconsistencies, as well as the required adjustments. **Comments** should be provided in the **datasets Excel spreadsheet** pointing out possible inconsistencies and necessary corrections. If needed, a **Word document** with general adjustments on the content and format of the datasets should also be provided. C40 will send the datasets Excel spreadsheets to be reviewed to the consultant at least one week prior to deliverable 3 deadline.

4.3 ADDITIONAL GUIDELINES

Language: all deliverables and communications of the project will be in English.

Deliverables approval: each deliverable will be reviewed and approved by C40 staff, improvements or additional information can be demanded from the consultant before the final approval.

4.4 PROJECT BUDGET

The budget range available is from USD 35,000 (thirty-five thousand USD) divided into the two workstreams of this RFP as follows:

Workstream	USD
Technical support to the expansion of the deep retrofits tool	15,000
Data collection support and five cities datasets review	20,000
Total project budget	35,000

Please provide a breakdown of costings, including day rates. Note that all costs (including taxes, etc.) should fall within this amount.

4.5 PROJECT TIMELINE

The deliverables timeline is planned as below, but slight adjustments may be needed according to the pace of interactions and data collection with participant cities.

Deliverables	Period/Date
Summary Word document from bi-weekly meetings with C40 compiling the recommendations provided to each item discussed	July 25th – March 17th, 2023
Recommendations from the first detailed review of the tool (to track errors and anticipate users' difficulties and questions, and a tool test with fictitious data) for improving the first intermediate version	September 11th, 2022
Detailed review of datasets of the five participant cities	February 24th, 2023
Recommendations from the second review of the tool (sense checking, picking up any remaining errors, and identifying non-anticipated user needs) for improving the second intermediate version	March 10th, 2023
Complementary datasets to the cities' data addressing the gaps identified and suggested proxies	March 17th, 2023
Detailed review of the final datasets and proxies to be used for the five cities assessment on the deep retrofit tool	March 31st, 2023
Recommendations for improving final/complete version of the tool (considering its format and navigability, and includes a final check of its formulas).	March 31st, 2023

4.6 BIDDER GUIDANCE

Bidders should provide the following items as part of their proposal for consideration:
- Description of relevant experience in Excel-based tool development and quantitative data collection, management and analysis, as well as the consultant experience in the building retrofit field.
- Brief description of the methodological approach proposed for undertaking the activities and elaborating the deliverables required in this RFP.
- Possible risks and barriers, if any, foreseen to implementing the workstreams and producing the deliverables of this RFP.
- Budget with a breakdown of costings, considering the required flexibility on hours of technical support for the deep retrofit tool expansion.
- Summary CVs of the researchers involved highlighting the relevant experience for this project - no more than 2 pages each CV.

- <u>Bidders should review the attached C40 Service Providers Agreement (SPA), please either confirm acceptance of the agreement or add comments in the SPA document and attach it to the email in response to this RFP.</u>

4.7 BIDDER EVALUATION CRITERIA

C40 will evaluate proposals based on the following criteria:
- Relevant research experience and expertise in Excel-based tool development, and quantitative research and knowhow on building retrofit.
- Consistency of the methodological approach proposed.
- Clarity of the contribution that can be provided to the project.

Proposals will be evaluated against the following criteria (example table below):

Expertise and experience of the bidder across relevant topics	40%
Interpretation of the work and proposal for delivery approach	20%
Potential contribution and cost-effectiveness of the proposal	20%
Project management and ability to deliver products on time	20%

Note that all costs should be included (overheads, incidentals, tax, etc.).

4.8 RFP TIMELINE

RFP response deadline	July 15th, 2022
Tender evaluation	July 29th, 2022
Confirmation with selected consultant team	August 5th, 2022
Project kick-off	August 12th, 2022

| Project closure | April 14th, 2023 |

Each bidder must submit 1 electronic copy of their proposal to the email address below by July 15th, 2022, by midnight (GMT).

CONTACT

All questions related to this RFP should be directed by email to:
Mariana Nicolletti, C40 Senior Research Manager: mnicolletti@c40.org